

XVIII.—*Natural History Notes from H.M. Indian Marine Survey Steamer 'Investigator,' Commander C. F. Oldham, R.N., commanding.*—Series II., No. 18. *On a new Species of Viviparous Fish of the Family Ophidiidæ.* By A. ALCOCK, Superintendent of the Indian Museum.

Family Ophidiidæ.

DIPLACANTHOPOMA, Günther.

Diplacanthopoma, Günther, 'Challenger' Deep-sea Fishes, p. 115.

Diplacanthopoma Rivers-Andersoni, sp. n.

The tail (caudal included) is not quite half, the head is considerably more than one fourth, the height of the body is about one fifth of the total length (caudal included).

The head (including the branchiostegal rays and the greater part of the isthmus, but excluding the occiput), and also the greater part of the dorsal and anal fins, are invested in a thick glandular scaleless skin, which is of a much darker colour than, and is very definitely delimited from, the scaly covering of the body. The head is without any armature except the two sharp, flat, oblique spines, which project freely, one at the upper, the other at the lower angle of the operculum.

The eye, which is about two thirds the length of the depressed snout and between one sixth and one seventh the length of the head, is sunk beneath thick transparent skin, without any orbital fold.

The nostrils are situated one in front of the eye, the other near the tip of the snout, on either side.

The mouth is large; the maxilla, which reaches a little behind the after limit of the eye, is half the length of the head, and is not overhung by the snout, but overlaps the mandible. Villiform teeth are present in bands on the jaws, vomer, and palatines, the bands on the jaws being rather widely interrupted at the symphyses. The tongue is short and broad and has only the tip free.

The gill-openings are extremely wide; the branchiostegal rays are eight in number and their membranes are quite free; there are three large lanceolate gill-rakers on the outer border of the first arch, but elsewhere the gill-rakers are tuberculi-form. There are no traces of pseudobranchiæ.

The lateral line appears to have been present only on the anterior part of the trunk.

The dorsal fin begins about an eye-length behind the level

of attachment of the pectoral rays; it and the anal are continuous with the caudal.

The pointed pectorals are not much more than one third the length of the head, and the ventrals are still shorter.

The ventrals, which are inserted less than an eye-length behind the pectoral symphysis, consist on each side of a single ray, which, however, has its surface fluted, as if it were made up of several rays bound together and fused.

The stomach is siphonal; the intestine is in three long folds, and, as in *D. brachysoma*, there are no pyloric cæca. A large thick-walled air-bladder is present.

The ovaries, which open on a fleshy cushion behind the vent, are, in the single specimen obtained, closely packed with embryos and ova.

Colours in spirit: body purplish brown; head much darker, inclining to the colour of the fins, which are purplish black.

Total length a little over 15 inches.

Loc. Arabian Sea, lat. $22^{\circ} 14' 25''$ N., long. $67^{\circ} 8' 55''$ E., 947 fathoms.

The present species differs from *Diplacanthopoma brachysoma*, Gthr., in the following particulars:—

1. It is much larger and is viviparous. The 'Challenger' specimen of *D. brachysoma* is stated to be $4\frac{1}{2}$ inches long; and a single female of *D. brachysoma* dredged by the 'Investigator' in 1888 is $4\frac{1}{4}$ inches long, and has ovaries full of large ova in which no traces of an embryo can at the present moment be detected.

2. The length of the head is not half the combined length of the head and trunk; whereas in *D. brachysoma* the head is more than half this measure.

3. The eye is smaller, its length being two thirds that of the snout, less than one sixth that of the head, and not very much more than half the width of the interorbital space; whereas in *D. brachysoma* the eye is as long as the snout, one fifth the length of the head, and equal to the width of the interorbital space.

4. The dorsal fin arises an appreciable distance behind the base of the pectoral; whereas in *D. brachysoma* it arises immediately behind the base of the pectoral.

5. The ventral fins arise at the level of the posterior border of the operculum, instead of beneath the middle of the operculum as in *D. brachysoma*.

In other respects, as well as in general appearance, the two species have the closest resemblance.

The ovaries of *Diplacanthopoma Rivers-Andersoni* consist of a densely packed mass of embryos and ova enclosed in a thin but extremely tough capsule. The capsule is abundantly supplied with blood by the ramifications of a large branch of the mesenteric artery.

There is no attachment or adhesion of any kind between the ovarian capsule and its contents.

The embryos form a thick surface layer immediately beneath the capsule, enclosing a central mass of largish (a little over 1 millim. diameter) ova, which consist entirely of yolk-spherules, without any trace of an embryo or even of a germinal area.

Whether these unchanged ova would have developed subsequently to the birth of the present superficial layers of embryos, or whether they were destined for the intra-ovarian nourishment of the present embryos, are questions which it is impossible in an isolated case to discuss; but from their large size, which precludes any suggestion of immaturity, it would seem probable that they were intended for present use rather than for a future brood.

The embryos, which are long and eel-like—6 to 8 millim. long—lie matted together, and firmly adhering to one another by their tails by means of a coagulated secretion.

The vertical fins only are represented by a long fold of integument, which runs from the occiput, round the tip of the tail, to the vent. This fold of integument consists of layer upon layer of large-nucleated cells. The remains of the yolk-sac are enclosed in the abdomen, causing a bulging of the abdominal wall along its whole length, from the throat to the vent; but there is no vitelline constriction or pedicle.

I am inclined to think that the vertical fold of the integument, which is really only an extended sheet of embryonic cells, is an absorbent (nutritive) surface, somewhat as in the embryos of certain fishes of the family Embiotocidæ, in which the interradianal membranes of the vertical fins have been shown to play the part of a foetal placenta.

In the present case, however, there is no vascular connexion, at any rate on the foetal side; and I am inclined to think that the nutrient material is absorbed not so much from the thin tough ovarian capsule as from the ovary itself, namely from those ova in which no trace of a germinal vesicle can be found.

An embryo taken at random measures 8 millim., namely 2 millim. from the snout to the vent and 6 millim. from the vent to the tip of the tail.